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DOKUZ EYLÜL UNIVERSITY FACULTY OF SCIENCE  
DEPARTMENT OF MATHEMATICS  
ALGEBRA GROUP

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## ALGEBRA SEMINARS

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### Annihilators of Cartier Quotients

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#### ABSTRACT

Let  $R$  be a commutative Noetherian ring of prime characteristic  $p$ ,  $M$  be an  $R$ -module and  $e$  be a positive integer. Let  $f : R \rightarrow R$  be the Frobenius homomorphism given by  $f(r) = r^p$  for all  $r \in R$  whose  $e$ -th iteration is denoted by  $f^e$ . An  $e$ -th Cartier map on  $M$  is an additive map  $C : M \rightarrow M$  such that  $rC(m) = C(r^{p^e}m)$  for all  $r \in R$  and  $m \in M$ . An  $R$ -module is called a Cartier module if it is equipped with a Cartier map.

In the case that the Frobenius homomorphism is finite and  $M$  is a finitely generated  $R$ -module equipped with a surjective Cartier map, it is proved by M. Blickle and G. Böckle in [?] that the set of annihilators of Cartier quotients of  $M$  is a finite set of radical ideals consisting of intersections of the finitely many primes in it. In these talks, I will consider the case that  $R$  is a finite dimensional polynomial ring over a field of prime characteristic  $p$ , and I take a computational view of this finiteness result and drop the finiteness condition on the Frobenius homomorphism to give an alternative proof to the result.

#### References

[BB09] M. Blickle and G. Böckle, *Cartier modules: finiteness results*.  
<https://arxiv.org/abs/0909.2531>

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**DATE AND TIME:** 12th of December, 2018, Wednesday, 09:30

**PLACE:** Dokuz Eylül University, Tinaztepe Campus, Faculty of Science  
Department of Mathematics, Buca/İzmir. **Room B206.**

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